

CLAIMS

- 1 1. A distributed method for assigning designations to endpoints for use in a peer-to-peer collaboration system having a plurality of members that share a telespace and exchange data change requests, the method comprising:
 - 4 (a) assigning a unique designation to each endpoint of each member of the telespace, each designation of a member indicative of the order in which the member joined the telespace; and
 - 7 (b) for each member invited to join by another telespace member comprising the inviting member, assigning a unique endpoint designation indicative of the inviting member.
- 1 2. The method of claim 1 wherein step (a) comprises assigning a unique numeral designation to each endpoint.
- 1 3. The method of claim 2 wherein step (b) comprises assigning a unique serial numeral designation to each endpoint wherein the serial numeral designation comprises a series of numbers including the numeral designation of the inviting member.
- 1 4. The method of claim 1, wherein a plurality of the designations of different endpoints each indicate a chain of inviting members.
- 1 5. The method of claim 1, wherein endpoint designations comprise a number of orders, including a first order designating a founding member of the telespace, and at least a second order designating a member invited to join the telespace by the founding member.
- 1 6. The method of claim 1, wherein step (a) comprises:

2 (a1) upon creation of the telespace, an endpoint corresponding to a founding
3 telespace member assigning itself a unique designation comprising a first
4 order digit; and

5 wherein step (b) comprises:

6 (b1) subsequent to creation of the telespace, assigning, by the founding
7 member, each of a plurality of endpoints corresponding to a new member
8 of the telespace invited into the telespace by the founding member a
9 unique designation comprising the first order digit of the founding
10 telespace member, and a second order digit, the second order digits of the
11 designations of endpoints of the new members being in a sequential order
12 indicating the order in which the new members joined the telespace.

1 7. The method of claim 6 further comprising:

2 (c) inserting endpoint designations into data change requests.

1 8. The method of claim 7 further comprising:

2 (d) using the endpoint designations in data change requests to resolve a
3 dependency collision between two data requests.

1 9. The method of claim 8 wherein step (d) comprises resolving a dependency
2 collision while maintaining total ordering.

1 10. The method of claim 9 wherein step (d) comprises:

2 (d1) comparing endpoint digits on an order-by-order basis; and
3 (d2) scheduling data change requests so that data change requests with the
4 lowest endpoint digits in the lowest orders are scheduled for processing
5 first.

1 11. The method of claim 1 further comprising:

2 (c) inserting endpoint designations into data change requests.

1 12. The method of claim 11 further comprising:

2 (d) using the endpoint designations in data change requests to resolve a
3 dependency collision between two data requests.

1 13. The method of claim 12 wherein step (d) comprises resolving a dependency
2 collision while maintaining total ordering.

1 14. The method of claim 1, wherein step (b) comprises each of the inviting members
2 assigning a unique designation to each new telespace member that an inviting
3 endpoint invites into the telespace.

1 15. The method of claim 1 wherein step (b) comprises, for each member invited to
2 join the telespace by another telespace member, the inviting member, assigning
3 a endpoint designation that is unique within the telespace.

1 16. The method of claim 1, wherein step (b) comprises, for each member invited to
2 join the telespace by another telespace member, the inviting member assigning a
3 endpoint designation that is unique within the collaboration system.

1 17. The method of claim 1, wherein step (a) comprises using a pseudo-random
2 number generator to generate each designation.

1 18. A distributed apparatus for assigning designations to endpoints for use in a peer-
2 to-peer collaboration system having a plurality of members that share a
3 telespace and exchange data change requests, the apparatus comprising:

4 means for assigning a unique designation to each endpoint of each
5 member of the telespace, each designation of a member indicative of the order in
6 which the member joined the telespace; and

7 means operable for each member invited to join by another telespace
8 member comprising the inviting member, for assigning a unique invited member
9 endpoint designation indicative of the inviting member.

1 19. The apparatus of claim 18 wherein the means for assigning endpoint
2 designations for each member comprises means for assigning a unique numeral
3 designation to each endpoint.

1 20. The apparatus of claim 19 wherein the means for assigning invited member
2 endpoint designations comprises means for assigning a unique serial numeral
3 designation to each endpoint wherein the serial numeral designation comprises a
4 series of numbers including the numeral designation of the inviting member.

1 21. The apparatus of claim 18, wherein a plurality of the designations of different
2 endpoints each indicate a chain of inviting members.

1 22. The apparatus of claim 18, wherein endpoint designations and invited member
2 endpoint designations comprise a number of orders, including a first order
3 designating a founding member of the telespace, and at least a second order
4 designating a member invited to join the telespace by the founding member.

1 23. The apparatus of claim 18, wherein the means for assigning endpoint
2 designations comprises:

3 means operable upon creation of the telespace, for assigning to an
4 endpoint corresponding to a founding telespace member a unique designation
5 comprising a first order digit; and

6 wherein the means for assigning invited member endpoint designations
7 comprises:

8 means operable subsequent to creation of the telespace and by the
9 founding member, for assigning each of a plurality of endpoints corresponding to
10 a new member of the telespace invited into the telespace by the founding
11 member a unique designation comprising the first order digit of the founding
12 telespace member, and a second order digit, the second order digits of the
13 designations of endpoints of the new members being in a sequential order
14 indicating the order in which the new members joined the telespace.

- 1 24. The apparatus of claim 23 further comprising means for inserting endpoint
2 designations into data change requests.
- 1 25. The apparatus of claim 24 further comprising means for using the endpoint
2 designations in data change requests to resolve a dependency collision between
3 two data requests.
- 1 26. The apparatus of claim 25 wherein the means for resolving a dependency
2 collision comprises means for resolving a dependency collision while maintaining
3 total ordering.
- 1 27. The apparatus of claim 26 wherein the means for resolving a dependency
2 collision comprises:
 - 3 means for comparing endpoint digits on an order-by-order basis; and
 - 4 means scheduling data change requests so that data change requests
 - 5 with the lowest endpoint digits in the lowest orders are scheduled for processing
 - 6 first.

- 1 28. The apparatus of claim 18 further comprising means for inserting endpoint
- 2 designations into data change requests.

- 1 29. The apparatus of claim 28 further comprising means for using the endpoint
- 2 designations in data change requests to resolve a dependency collision between
- 3 two data requests.

- 1 30. The apparatus of claim 29 wherein the means for resolving a dependency
- 2 collision comprises means for resolving a dependency collision while maintaining
- 3 total ordering.

- 1 31. The apparatus of claim 18, wherein the means for assigning invited member
- 2 endpoint designations comprises means operable by each of the inviting
- 3 members for assigning a unique designation to each new telespace member that
- 4 an inviting endpoint invites into the telespace.

- 1 32. The apparatus of claim 18 wherein the means for assigning invited member
- 2 endpoint designations comprises, for each member invited to join the telespace
- 3 by another telespace member, means in the inviting member for assigning a
- 4 endpoint designation that is unique within the telespace.

- 1 33. The apparatus of claim 18, wherein the means for assigning invited member
- 2 endpoint designations comprises, for each member invited to join the telespace
- 3 by another telespace member, means operable by the inviting member for
- 4 assigning a endpoint designation that is unique within the collaboration system.

- 1 34. The apparatus of claim 18, wherein the means for assigning endpoint
- 2 designations comprises a pseudo-random number generator that generates each
- 3 designation.

1 35. A computer data signal embodied in a carrier wave for assigning designations to
2 endpoints for use in a peer-to-peer collaboration system having a plurality of
3 members that share a telespace and exchange data change requests, the
4 computer data signal comprising:

5 program code for assigning a unique designation to each endpoint of each
6 member of the telespace, each designation of a member indicative of the order in
7 which the member joined the telespace; and

8 for each member invited to join by another telespace member, program
9 code operable by the inviting member for assigning a unique endpoint
10 designation indicative of the inviting member.

1 36. The computer data signal of claim 35 wherein the program code for assigning a
2 unique designation to each endpoint comprises program code for assigning a
3 unique numeral designation to each endpoint.

1 37. The computer data signal of claim 36 wherein the program code operable by the
2 inviting member for assigning a unique endpoint designation indicative of the
3 inviting member comprises program code for assigning a unique serial numeral
4 designation to each endpoint wherein the serial numeral designation comprises a
5 series of numbers including the numeral designation of the inviting member.